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Astronomy & Physics Weekly News

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Top News

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Dazzling laser feats earn these physicists a Nobel

TRICKS OF LIGHT Flourishes of laser virtuosity garnered the Nobel Prize in physics for three scientists: Arthur Ashkin (left), Gérard Mourou (middle) and Donna Strickland (right).

Fantastic feats performed with lasers have earned three scientists the 2018 Nobel Prize in physics.

Half of the award, which totals 9 million Swedish kronor (about $1 million), went to physicist Arthur Ashkin for his development of optical tweezers. The technique uses laser light to manipulate tiny particles such as viruses and bacteria.

The other half of the prize went to two scientists who created intense, short bursts of laser light. Physicists Gérard Mourou and Donna Strickland found a way to produce these powerful laser pulses using a method called chirped pulse amplification, which has been harnessed for purposes such as laser eye surgery.

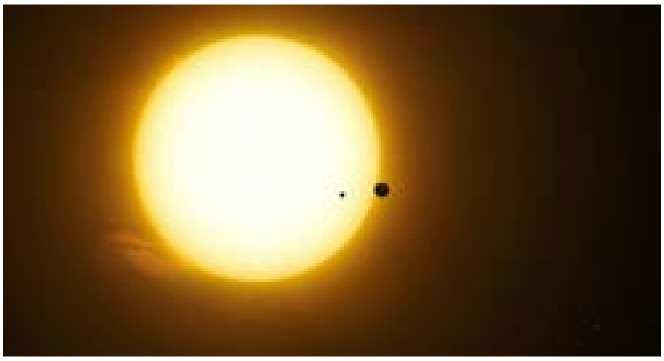
The award marks only the third time a woman has been awarded the physics Nobel. Previous female winners were Marie Curie in 1903 and Maria Goeppert Mayer in 1963.

In his work at Bell Laboratories in Holmdel, N.J., Ashkin took advantage of the fact that individual subatomic particles of light exert pressure. By focusing a laser beam just so, Ashkin realized that small objects could be trapped and moved around by the forces of the particles of light, or photons.

Ashkin's Nobel was "a thoroughly well-deserved and long-overdue award," says physicist Philip Jones of University College London.

Since 1986, when Ashkin's initial study on optical tweezers was published, the technique's popularity has exploded. Hundreds of labs across the world now use optical tweezers, says Jones, whose research relies on Ashkin's work. Optical tweezers have been used for myriad purposes: testing how DNA stretches, studying the forces exerted by individual cells, and initiating chemical reactions between a single pair of atoms, to name a few (SN: 5/12/18, p. 24). By building on the optical tweezer technique, scientists were able to trap and cool atoms, a discovery that led to the 1997 Nobel in physics. ...Read More...

Hubble may have spotted the first known exomoon



SIDE BY SIDE A Jupiter-sized planet and a Neptune-sized moon cross in front of the star Kepler 1625 in this artist's illustration. Hubble spotted signs of the moon in observations made in October 2017.

The first suspected exomoon is coming into focus. Observations with the Hubble Space Telescope bolster the case for a Neptune-sized moon orbiting a gas exoplanet 8,000 light-years away, astronomers report October 3 in Science Advances. The moon's existence, if confirmed, would challenge theories of how satellites are born.

Astronomers David Kipping and Alex Teachey of Columbia University trained Hubble on the star Kepler 1625 for 40 hours on October 28 and 29, 2017. The star was known to have a Jupiter-sized planet orbiting it every 287 days, thanks to observations by the Kepler space telescope, which detects dips in starlight that indicate a planet is transiting in front of the star.

Teachey and Kipping had seen signs in the Kepler data of a second dimming, either before or after the planet passed – exactly what they would expect if an exomoon were orbiting the planet. The pair named the putative moon Kepler 1625b i, or "Neptmoon" for short. But the researchers needed more observations to be sure it really was a moon, not another planet or activity on the star.

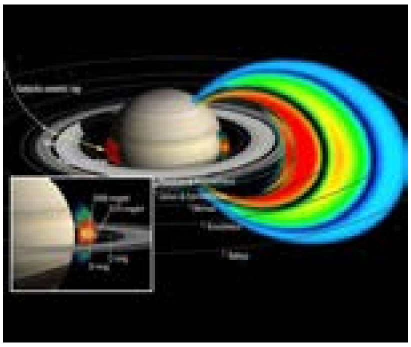
Hubble, whose sensitivity is 3.8 times Kepler's, spotted a secondary dip in light after the planet crossed the star. The planet also started its 19-hour transit 77.8 minutes earlier than expected, suggesting that something was tugging gravitationally on the planet.

Both signals are consistent with Neptmoon existing. Still, "we're not cracking open champagne bottles just yet," Teachey said in an Oct. 1 news conference. The team wants to check with Hubble again, hopefully during the next transit in May 2019, he said. "Things look exciting, tantalizing, maybe compelling."

Astrophysicist René Heller of the Max Planck Institute for Solar System Research in Göttingen, Germany, says that while the data analysis is impressive, "I remain skeptical" about the exomoon's existence. He also wants to see another transit and better observations of the star.

One reason for caution is the strangeness of the moon itself. In our solar system, moons form in ...Read More...

New Radiation Belt Discovered at Saturn



This image shows the proton radiation belts of Saturn. The radiation in the area between the planet and the D-ring can be seen enlarged in the inset and was first observed in the last mission phase of the Cassini mission. It is created by the incidence of galactic cosmic radiation on the planet's rings. The protons generated in this way subsequently interact with the atmosphere of Saturn, its thin D-ring and its ringlets.

Approximately one year ago a spectacular dive into Saturn ended NASA's Cassini mission - and with it a unique, 13-year research expedition to the Saturnian system. In the mission's last five months, the probe entered uncharted territory again: 22 times it plunged into the hitherto almost unexplored region between the planet Saturn and its innermost ring, the D-ring.

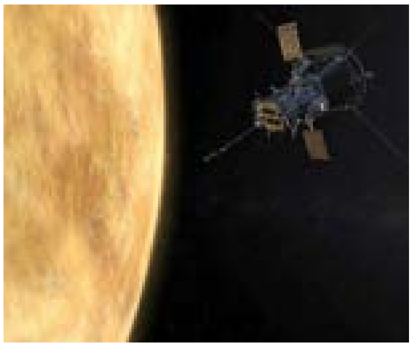
On Friday, 5 October 2018, the journal Science is releasing a total of six articles describing first results from this mission phase. In one of these papers a research team led by the Max Planck Institute for Solar System Research in Germany and the Applied Physics Laboratory of the Johns Hopkins University in the USA for the first time reports on the unique proton radiation belts formed in close proximity to the planet. Due to presence of the dense A-, B-, and C-rings, this area is almost completely decoupled from the main radiation belt and the rest of the magnetosphere, which extend farther outward.

When the space probe Cassini swung into its first orbit around Saturn and its rings on July 1, 2004, the MIMI particle detector suite (Magnetospheric Imaging Instrument), including LEMMS (Low Energy Magnetospheric Measurement System), which had been developed and built under the leadership of MPS, caught a brief glimpse of the region between the planet and the innermost D ring.

The measurements indicated that a population of charged particles may be present, but its exact composition and properties remained obscure. In the following years, MIMI-LEMMS investigated the particles that are trapped by Saturn's strong magnetic field outside its rings, forming its main radiation belt that consists of high energy protons and electrons.

The proton radiation belt extends more than 285,000 kilometers into space and is strongly influenced by Saturn's numerous moons, which segment it into five sectors. "Only 13 years later, shortly before the end of the mission, we were given the opportunity to follow up ...Read More...

Parker Solar Probe Changed the Game Before it Even Launched



Parker Solar Probe completed its first flyby of Venus on Oct. 3, 2018, during a Venus gravity assist, where the spacecraft used the planet's gravity to alter its trajectory and bring it closer to the Sun.

On Oct. 3, 2018, Parker Solar Probe performed the first significant celestial maneuver of its seven-year mission. As the orbits of the spacecraft and Venus converged toward the same point, Parker Solar Probe slipped in front of the planet, allowing Venus' gravity - relatively small by celestial standards - to twist its path and change its speed. This maneuver, called a gravity assist, reduced Parker's speed relative to the Sun by 10 percent - amounting to 7,000 miles per hour - drawing the closest point of its orbit, called perihelion, nearer to the star by 4 million miles.

Performed six more times over the course of the seven-year mission, these gravity assists will eventually bring Parker Solar Probe's closest approach to a record 3.83 million miles from the Sun's surface - about a seventh the distance of the current record-holder, Helios 2, which achieved a pass of 27 million miles from the Sun in 1976. Even before its closest approach, Parker Solar Probe is expected to overtake this record and become the closest human-made object to the Sun in late October 2018.

A long-held dream

A solar probe has been on the minds of scientists and engineers for decades, since the late '50s, when a new theory and the first satellite measurements of the Sun's constant outflow of material, called the solar wind, pointed towards previously unsuspected complexity.

But if you'd asked anyone before 2007 - well after serious planning for such a mission began - Venus would not have come up as the key to the mission puzzle. For the three-plus decades that various committees and teams worked on different concepts for the solar probe mission, it was widely agreed that the only way to dive into the solar atmosphere required sending the spacecraft to Jupiter first.

"No one believed using Venus gravity assists would be possible, because the gravity assist a planetary body can provide is proportional to the body's mass, and Venus' mass is so much smaller - only 0.3 percent of Jupiter's," said Yanping Guo, mission design ...Read More...

Newly detected microquasar gamma-rays 'call for new ideas'

illustration only

The first-ever detection of highly energetic radiation from a microquasar has astrophysicists scrambling for new theories to explain the extreme particle acceleration. A microquasar is a black hole that gobbles up debris from a nearby companion star and blasts out powerful jets of material.

"What's amazing about this discovery is that all current particle acceleration theories have difficulties explaining the observations," said Hui Li, a theorist in Los Alamos National Laboratory's Theoretical Division who served on the team. "This surely calls for new ideas on particle acceleration in microquasars and black hole systems in general."

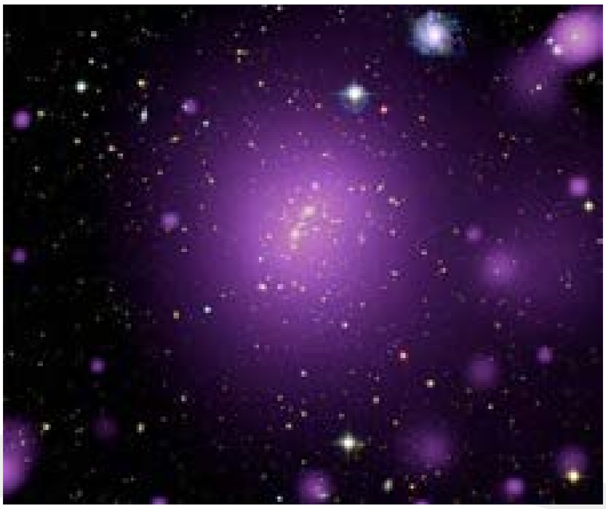
The team's observations, described in the Oct. 4 issue of the journal Nature, strongly suggest that particle collisions at the ends of the microquasar's jets produced the powerful gamma rays. Scientists think that studying messages from this microquasar, dubbed SS 433, may offer a glimpse into more extreme events happening at the centers of distant galaxies.

The team gathered data from the High-Altitude Water Cherenkov Gamma-Ray Observatory (HAWC), which is a mountain-top detector in Mexico that observes gamma ray emission from supernova remnants, rotating dense stars called pulsars, and quasars. Los Alamos, funded by Department of Energy Office of High-Energy Physics, helped build HAWC, which was completed in 2015.

Now, the team has studied one of the most well-known microquasars, which is about 15,000 light years away.

Quasars are massive black holes that suck in material from the centers of galaxies, rather than feeding on a single star. They actively emit radiation visible across the universe. But most are so far away that the majority of the detected quasars must have their jets aimed at Earth, making them easier to spot, like looking directly into a flashlight. In contrast, SS 433's jets are oriented away from Earth, which makes them more difficult to observe. However, HAWC was able to detect similarly energetic light when viewed from the side, allowing the full length of the jet to be visible." ..Read More...

Observations challenge cosmological theories



The picture shows the galaxy cluster XLSSC 006. This composite image results from the combination of smoothed X-ray data from the XXL survey (purple) together with optical and infrared observations from the Canada-France-Hawaii Telescope.

Recent observations create a puzzle for astrophysicists: since the big bang, less galaxy clusters have formed over time than was actually expected. Physicists from the university of Bonn have now confirmed this phenomenon.

For the next three years, the researchers will analyze their data in even greater detail. This will put them in a position to confirm whether the theories considered valid today need to be reworked. The study is part of a series of 20 publications which appear in the professional journal "Astronomy and Astrophysics".

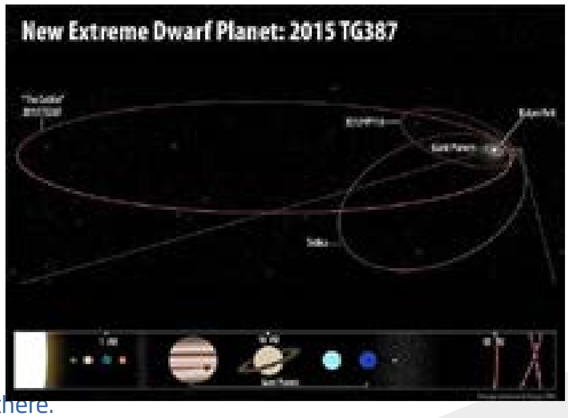
Nearly 13.8 billion years ago, the big bang marked the beginning of our universe. It created space and time, but also all the matter of which our universe consists today. From then on, space expanded at a terrifying rate and so did the diffuse fog in which the matter was nearly evenly distributed.

But not completely: at some places the fog was a little bit denser than in others. As a result, these regions exerted a slightly stronger gravitational pull and slowly attracted material from their surroundings. Over time, matter concentrated more and more within these condensation points. At the same time, the space between them gradually became emptier. Over 13 billion years, this resulted in the formation of a sponge-like structure: big "holes" devoid of matter, separated by small areas within which thousands of galaxies agglomerate - the galaxy clusters.

Six parameters explain the whole universe

The standard model of cosmology describes this history of the universe, from the first seconds after the big bang to the current day. The beauty of it: the model manages to explain, with only six parameters, everything we know today about the birth and evolution of the Universe. ...Read More...

While seeking Planet X, astronomers find a distant solar system object



Out there.

Astronomers have discovered a new object at the edge of our solar system. The new extremely distant object far beyond Pluto has an orbit that supports the presence of a larger Planet X.

The newly-found object, called 2015 TG387, was announced by the International Astronomical Union's Minor Planet Center on October 1. A paper with the full details of the discovery has also been submitted to The Astronomical Journal. The discovery was made by Carnegie Institution for Sciences' Scott Sheppard, Northern Arizona University's Chad Trujillo, and the University of Hawaii Institute for Astronomy's David Tholen.

2015 TG387 was discovered about 80 astronomical units (AU) from the sun. One AU is the distance between the Earth and Sun. For context, Pluto's distance is around 34 AU, so 2015 TG387 is about two-and-a-half times further away from the sun than Pluto is right now.

"We think there could be thousands of small bodies like 2015 TG387 out on the solar system's fringes, but their distance makes finding them very difficult," Tholen said. "Currently we would only detect 2015 TG387 when it is near its closest approach to the sun. For some 99 percent of its 40,000-year orbit, it would be too faint to see, even with today's largest telescopes."

Tholen first observed 2015 TG387 in October of 2015 at the Japanese Subaru 8-meter telescope on Maunakea, Hawaii. The team's software detected the unusual moving object, which led Tholen to more carefully measure the object's position and determine where to point other telescopes for follow-up observations.

It took the team a few years of observations to obtain a good orbit for 2015T G387 because it moves slowly, over a large orbit, so it has a very long orbital period. Follow-up observations at the Magellan telescope at Carnegie's Las Campanas Observatory in Chile and the Discovery Channel Telescope in Arizona, were obtained in 2015, 2016, 2017 and 2018, to measure 2015 TG387's orbit. ...Read More...

New evidence suggests particles detected in Antarctica don't fit Standard Model

The ANITA-IV experiment in Antarctica, prior to being launched on a balloon. Credit: Drummermean/CC BY-SA 4.0

A team of researchers at Penn State University has found new evidence that suggests some particles detected in Antarctica do not fit the Standard Model. They have written a paper outlining their arguments and have posted it on the arXiv preprint server.

Prior research has shown that when low energy cosmic particles encounter the Earth, they are likely to pass right on through—high energy particles, on the other hand, are almost certain to run into something else, preventing them from passing through in one piece. Instead, they cause an avalanche of collisions, creating a shower of particles that eventually emerge on the other side of the planet. But what if a high-energy particle were to make it all the way through without creating a particle shower? That would mean there likely exists a particle that is not described by the Standard Model—and that is exactly what researchers studying particles detected over Antarctica are reporting.

To date, two odd particle events have been detected by a sensor attached to a high-altitude balloon hovering over Antarctica as part of a project called the Antarctic Impulsive Transient Antenna (ANITA)—the first detection was back in 2006, the second in 2014. Both indicated that a high-energy particle had somehow made its way through the planet without encountering anything. The first detection was attributed to equipment problems or some other unknown factor. The second caused more concern—but not enough for anyone to seriously consider challenging the Standard Model. In this new effort, the researchers report that they have found other evidence of the same type of particle, suggesting the two anomalies might truly represent unknown particles.

The new evidence came in the form of sensor data from the IceCube experiment in which sensors buried in the Antarctic ice continually detect particle events. Data from the sensors showed that three events with unexplained properties had occurred. The researchers suggest the two unconnected sources of data indicate that it is time to start asking whether the anomalies hint ...Read More...

Black holes ruled out as universe's missing dark matter

A supernova (bright spot at lower left) and its host galaxy (upper center), as they would appear if gravitationally lensed by an intervening black hole (center). The gravitational field of the black hole distorts and magnifies the image and makes both the galaxy and the supernova shine brighter. Gravitationally magnified supernovas would occur rather frequently if black holes were the dominant form of matter in the universe. The lack of such findings can be used to set limits on the mass and abundance of black holes. Credit: Miguel Zumalacárregui image, UC Berkeley

For one brief shining moment after the 2015 detection of gravitational waves from colliding black holes, astronomers held out hope that the universe's mysterious dark matter might consist of a plenitude of black holes sprinkled throughout the universe.

University of California, Berkeley, physicists have dashed those hopes.

Based on a statistical analysis of 740 of the brightest supernovas discovered as of 2014, and the fact that none of them appear to be magnified or brightened by hidden black hole "gravitational lenses," the researchers concluded that primordial black holes can make up no more than about 40 percent of the dark matter in the universe. Primordial black holes could only have been created within the first milliseconds of the Big Bang as regions of the universe with a concentrated mass tens or hundreds of times that of the sun collapsed into objects a hundred kilometers across.

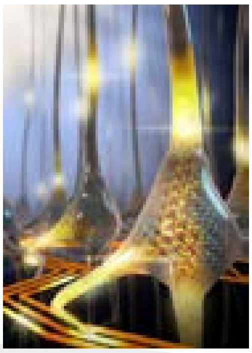
The results suggest that none of the universe's dark matter consists of heavy black holes, or any similar object, including massive compact halo objects, so-called MACHOs.

Dark matter is one of astronomy's most embarrassing conundrums: despite comprising 84.5 percent of the matter in the universe, no one can find it. Proposed dark matter candidates span nearly 90 orders of magnitude in mass, from ultralight particles like axions to MACHOs.

Several theorists have proposed scenarios in which there are multiple types of dark matter. But if dark matter consists of several unrelated components, each would require a different explanation for its origin, which makes the models very complex.

"I can imagine it being two types of black holes, very heavy and very light ones, or black holes and new particles. But in that case one of the components is ..Read More...

A new brain-inspired architecture could improve how computers handle data and advance AI



Brain-inspired computing using phase change memory. Credit: Nature Nanotechnology/IBM Research

IBM researchers are developing a new computer architecture, better equipped to handle increased data loads from artificial intelligence. Their designs draw on concepts from the human brain and significantly outperform conventional computers in comparative studies. They report on their recent findings in the Journal of Applied Physics.

Today's computers are built on the von Neumann architecture, developed in the 1940s. Von Neumann computing systems feature a central processer that executes logic and arithmetic, a memory unit, storage, and input and output devices. Unlike the stovepipe components in conventional computers, the authors propose that brain-inspired computers could have coexisting processing and memory units.

Abu Sebastian, an author on the paper, explained that executing certain computational tasks in the computer's memory would increase the system's efficiency and save energy.

"If you look at human beings, we compute with 20 to 30 watts of power, whereas AI today is based on supercomputers which run on kilowatts or megawatts of power," Sebastian said. "In the brain, synapses are both computing and storing information. In a new architecture, going beyond von Neumann, memory has to play a more active role in computing."

The IBM team drew on three different levels of inspiration from the brain. The first level exploits a memory device's state dynamics to perform computational tasks in the memory itself, similar to how the brain's memory and processing are co-located. The second level draws on the brain's synaptic network structures as inspiration for arrays of phase change memory (PCM) devices to accelerate training for deep neural networks. Lastly, the dynamic and stochastic nature of neurons and synapses inspired the team to create a powerful computational substrate for spiking neural networks.

Phase change memory is a nanoscale memory device built from compounds of Ge, Te and Sb ...Read More...

Curiosity Rover to Temporarily Switch 'Brains'

Curiosity selfie

Engineers at NASA's Jet Propulsion Laboratory in Pasadena, California, this week commanded the agency's Curiosity rover to switch to its second computer. The switch will enable engineers to do a detailed diagnosis of a technical issue that has prevented the rover's active computer from storing science and some key engineering data since Sept. 15.

Like many NASA spacecraft, Curiosity was designed with two, redundant computers - in this case, referred to as a Side-A and a Side-B computer - so that it can continue operations if one experiences a glitch. After reviewing several options, JPL engineers recommended that the rover switch from Side B to Side A, the computer the rover used initially after landing. The rover continues to send limited engineering data stored in short-term memory when it connects to a relay orbiter. It is otherwise healthy and receiving commands. But whatever is preventing Curiosity from storing science data in long-term memory is also preventing the storage of the rover's event records, a journal of all its actions that engineers need in order to make a diagnosis. The computer swap will allow data and event records to be stored on the Side-A computer.

Side A experienced hardware and software issues over five years ago on sol 200 of the mission, leaving the rover uncommandable and running down its battery. At that time, the team successfully switched to Side B. Engineers have since diagnosed and quarantined the part of Side A's memory that was affected so that computer is again available to support the mission. "At this point, we're confident we'll be getting back to full operations, but it's too early to say how soon," said Steven Lee of JPL, Curiosity's deputy project manager. "We are operating on Side A starting today, but it could take us time to fully understand the root cause of the issue and devise workarounds for the memory on Side B.

"We spent the last week checking out Side A and preparing it for the swap," Lee said. "It's certainly possible to run the mission on the Side-A computer if we really need to. But our plan is to switch back to Side B as soon as we can fix the problem to utilize its larger memory size." ...Read More...

Scientists develop a new way to remotely measure Earth's magnetic field

ISS file image.

Researchers in Canada, the United States and Europe have developed a new way to remotely measure Earth's magnetic field - by zapping a layer of sodium atoms floating 100 kilometres above the planet with lasers on the ground.

The technique, documented this week in Nature Communications, fills a gap between measurements made at the Earth's surface and at much higher altitude by orbiting satellites.

"The magnetic field at this altitude in the atmosphere is strongly affected by physical processes such as solar storms and electric currents in the ionosphere," says Paul Hickson an astrophysicist at the University of British Columbia (UBC) and author on the paper.

"Our technique not only measures magnetic field strength at an altitude that has traditionally been hidden, it has the side benefit of providing new information on space weather and atomic processes occurring in the region."

Sodium atoms are continually deposited in the mesosphere by meteors that vaporize as they enter Earth's atmosphere. Researchers at the European Southern Observatory (ESO), the University of Mainz and UBC used a ground-based laser to excite the layer of sodium atoms and monitor the light they emit in response.

"The excited sodium atoms wobble like spinning tops in the presence of a magnetic field," explains Hickson. "We sense this as a periodic fluctuation in the light we're monitoring, and can use that to determine the magnetic field strength." ...Read More...

Special Read:

Spectacular Draconid meteor shower in 2018?

Composite image of Draconids seen near Tucson, Arizona in 2013, by our friend Sean Parker Photography.

In 2018, there's no moon to spoil the show. The parent comet recently passed near. Best night is likely October 8. To see the most meteors … watch in the evening, not after midnight. And find a dark country sky!

October's Draconid meteor shower – sometimes called the Giacobinids – is gearing up. In 2018, a new moon on October 9 means no moonlight to drown the meteors in its glare. There's a second meteor shower – the South Taurids – also rambling along now, and you might catch some of those meteors, too. The Draconid shower is usually a sleeper, rarely offering any more than 5 meteors per hour. But watch out if the Dragon awakes! The Draconid meteor shower produced awesome meteor displays in 1933 and 1946, with thousands of meteors per hour seen in those years. European observers saw over 600 meteors per hour in 2011.

Will 2018's Draconid shower be spectacular?

Meteors in annual showers tend to storm when their parent comets are nearby. In 2018, the Draconids' parent – Comet 21P/Giacobini-Zinner – reached its perihelion or closest point to the sun on September 10. That's close! Is it close enough? Many are saying it's possible we'll see elevated levels of Draconids this year.

Or, it's possible we won't.

The shower is active between October 6 and 10. The best evening to watch is likely October 8; try the evenings of October 7 and 9 also. Notice the word evening. This is one shower you don't have to stay up late to see. Start watching first thing at nightfall. Be sure to watch under a dark, open, country sky.

How many Draconids will you see? In general, the Draconids aren't a rich shower, unless their parent comet is nearby. They typically produce only about five meteors per hour.

This annual meteor shower happens when Earth in its orbit crosses the orbital path of Comet 21P/Giacobini-Zinner. Debris left behind by this comet collides with the Earth's upper atmosphere, to burn up as Draconid meteors. This comet has an orbital period of about 6.6 years. It's about 6 times more distant at its farthest point from the sun than at its nearest point. At aphelion – its most distant point – it's farther out than the planet Jupiter. At perihelion – its closest point to the sun – it's about the Earth's distance from the sun.

On rare occasions – when the peak of the shower coincides with the comet's perihelion – this shower has been known to rain down hundreds or even thousands of meteors in an hour. ...Read More...

NASA, UAE Space Agency sign arrangement for cooperation in human spaceflight

NASA and the UAE Space Agency (UAESA) signed an Implementing Arrangement (IA) Monday, Oct. 1, that outlines cooperation across a range of areas related to space exploration and human spaceflight. The document was signed by H.E. Dr. Ahmad Belhoul Al Falasi, Minister of State for Higher Education and Advanced Skills, and Chairman of the UAE Space Agency, and NASA Administrator Jim Bridenstine during a ceremony at the 69th International Astronautical Congress, being held in Bremen, Germany Oct. 1-5.

The IA falls under the overarching Framework Agreement signed between the UAESA and NASA in June 2016, which established a framework for areas of cooperation in ground-based research; sub-orbital research; research and flight activities in low-Earth orbit (LEO); and human and robotic exploration in the vicinity of the moon, on the lunar surface, and beyond.

Bridenstine said, “As NASA builds cooperation for the return of humans to the Moon for long-term exploration and utilization, we welcome the opportunity to expand our partnership with the UAE Space Agency as it builds its significant capabilities on Earth, in low-Earth orbit, and beyond. UAE is currently working with U.S. universities to build an orbiter “Hope”, to launch in 2020 and reach Mars in 2021. I’m delighted to sign this agreement signifying our deepening relationship as we move forward into the next phase of exploration.” ...Read More...

First UAE Astronaut to Fly to ISS for 11-Day Mission on April 5, 2019

The first astronaut from the United Arab Emirates (UAE) will fly to the International Space Station (ISS) on April 5, 2019, and will return to Earth on April 16, 2019, the ISS launch schedule, shared with Sputnik, has shown.

According to the document, an astronaut will fly to the ISS on board the Russian Soyuz MS-12 spacecraft.

It has not been determined yet if Hazza Mansouri or Sultan Nayadi will take part in the mission. Both astronauts have qualified for it and have begun their training in Russia earlier in September.

A UAE astronaut will fly to the ISS as part of the crew comprising Russian cosmonaut Oleg Skripochka and US astronaut Christina Koch and will return to Earth together with Aleksey Ovchinin from Russia and Nick Hague from the United States.

UoS/SCASS Attend International Astronautical Congress 2018

Ms. Noora Al-Ameri (SCASS) attending the IAC 2018 in Bremen (Germany)

Following winning their membership in the International Astronomical Union (IAU), the Sharjah Center for Astronomy and Space Sciences (SCASS) participated in the 69th annual International Astronautical Congress (IAC) in Bremen, Germany. The International Astronautical Federation (IAF) along with the International Academy of Astronautics (IAA), the International Institute of Space Law (IISL), and the Space Generation Advisory Council (SGAC) organized the Congress from October 1st - 5th, 2018 under the theme "Involving Everyone".

The IAC is a leading international and interdisciplinary forum for space sciences and related topics with over 4000 participants and 1600 scientific presentations annually. The Congress this year puts emphasis on the new generation of space experts, expansion of equal opportunities, and the involvement of new countries and start-up companies in the global space field.

The Sharjah Center for Astronomy and Space Sciences' delegation used this opportunity in joining the IAC to highlight the various research initiatives and efforts at the Center and University of Sharjah including showcasing the on-going research projects at the Center's observatory and different research laboratories: the "CubeSat Lab", the "Space Weather and Ionosphere Lab", the "Meteorite Center", the "Radio Astronomy Lab", and the "Geographic Information Systems and Remote Sensing Center." SCASS also participated in this Congress with the aim of building connections with international participants, organizations, and institutes to explore potential future collaborative research ideas and projects.

SCASS also participated in the technical sessions and workshops offered at the IAC on Science and Exploration, Technology, Space and Society, Applications and Operations, and Infrastructure.

Following the 69th annual International Astronautical Congress (IAC), SCASS' delegation heads to Neustrelitz to the German Aerospace Center's (DLR) Institute of Communication and Navigation to visit the working group "Ionospheric Effects and Corrections." The group will present their operational space weather service (IMPC) and related research with the aim of identifying potential areas of collaboration and exploring joint project ideas between SCASS and the DLR. The delegation, during the visit to the DLR, will give an overview of the University of Sharjah and the Sharjah Center for Astronomy and Space Sciences' research projects and work as well as present the "Comparative Planetology of Martian Ionosphere" on-going research project at the Ionosphere Laboratory at SCASS.

This Week's Sky at a Glance - Oct. 06-12, 2018

Oct 06	Sa	01:58	Moon-Regulus: 1.9° S
		02:29	Moon Perigee: 366400 km
Oct 09	Tu	07:47	New Moon
Oct 12	Fr	01:21	Moon-Jupiter: 4.3° S